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09/830,825	07/30/2001	Heiner Scheer	10191/1810	2205

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EXAMINER

TUNG, TA HSUNG

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/830,825

Applicant(s)

SCHEER ETAL

Examiner

T. TUNG

Group Art Unit

1753

Paper No. 11

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 8/1/03

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 24-47 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 24-26, 28, 31-47 is/are rejected.

☒ Claim(s) 27, 29, 30 (would be allowable in independent form) is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

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Claims 24-26, 28, 31, 33, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Ep 678740.

As discussed in the previous Office action, Ep discloses a sensor element comprising a measuring gas chamber 6 and a reference gas chamber 10 located in a same zirconia solid electrolyte layer 4b but separated by a partition. An inner pump electrode 16 and a measuring electrode 22 are located in the measuring gas chamber opposite each other, while a reference electrode 24 is located in the reference gas channel. See figure 2; col. 11, line 27 to col. 13, line 9.

The wording “formed from a ceramic paste....” at the last two lines of claim 24 is a product-by-process expression and denotes no particular structural property of the final product. For the purpose of this rejection, it is totally irrelevant how the final product is derived so long as the claim’s final product does not distinguish from the reference.

This rejection is prompted by applicant’s amendment to claim 24, last two lines, that cancelled the positive recitation of the pasty layer.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep ‘740 in view of Kato et al 6,059,947.

This claim differs by calling for the measuring electrode to also serve as an inner pump electrode.

As discussed in the previous Office action, Kato discloses electrode 24 serving both as an inner pump electrode and as a measuring electrode. See figure 2; col. 6, line 54 to col. 9, line 19.

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It would have been obvious for Ep to combine the measuring electrode and an inner pump electrode into a single electrode so as to save space and material cost.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 in view of Makino et al 5,676,811.

This claim differs by calling for the reference electrode to be situated on a side of the reference gas chamber nearest a large surface of the sensor element exposed to a sample gas.

Makino discloses reference electrode 13 located on a side of a reference gas chamber 19 nearest a large surface of a sensor element exposed to a sample gas. See figure 1; col. 4, line 20 to col. 5, line 23. It would have been obvious for Ep to located its reference electrode 24 on the opposite side of the reference gas chamber in view of Makino. The incorporation of a known feature functioning as expected from analogous prior art is within the skill of the art.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 in view of Friese et al 5,314,604.

This claim differs by calling for the reference electrode to comprise two diametrically portions.

Friese discloses an electrode having two opposing portions 8-8'. See figure 1A; col. 3, line 23. It would have been obvious for Ep to adopt this opposing-portions configuration of Friese for its reference electrode, because it would provide more reference electrode surface area without additional space.

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Claims 38, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 in view of Sasayama et al 4,900,425.

These claims differ by calling the measuring electrode and the reference electrode to have a portion extending outside of its respective chamber.

Sasayama discloses an electrode 12 having a portion extending outside of a gas chamber 32. See figures 1-3; col. 2, line 9 to col. 4, line 2. It would have been obvious for Friese to extend a portion of its measuring and/or reference electrode outside of its gas chamber in view of Sasayama. The incorporation of a known feature functioning as expected from analogous prior art is within the skill of the art.

Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 in view of Holfelder et al 4,502,939 or Friese et al 5,314,604.

This claim differs by calling for the reference gas chamber to contain a porous ceramic material.

Holfelder discloses a porous filler material 42 within a gas chamber. See col. 5, lines 12-55. Friese discloses a porous filler material 14 in a reference gas chamber. See figure 2A; col. 3, line 53. It would have been obvious for Ep to adopt a porous filler material for its reference gas chamber to protect the reference electrode from direct exposure to a reference gas such as the atmosphere.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 in view of Yamada 4,505,807.

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This claim differs by calling for the sensor element to have a heater located about halfway between the top and the bottom surfaces of the element.

Yamada discloses a heater 13 located about halfway between the top and the bottom surfaces of a sensor element. See figures 1, 2, 4, 5; col. 3, line 23 to col. 9, line 8. It would have been obvious for Ep to locate its heater 36 about halfway between the top and the bottom surfaces of the sensor element so as to provide a more uniform heating of the sensor element. Arranging the heater near the bottom surface would tend to heat the bottom portion of the sensor element more than the top portion.

Claims 24-26, 28, 33-35, 40, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Friese et al '604.

As discussed in the previous Office action, Friese discloses a sensor element comprising a zirconia solid electrolyte layer 2 that has a reference gas chamber 10. A measuring gas chamber with an inner pump electrode 8-8' can also be considered to be in solid electrolyte layer 2 because the measuring gas chamber is partly in electrolyte layer 2. Therefore, the two gas chambers are in the "same layer plane". Element 9 is a measuring electrode, while element 11 is a reference electrode. See col. 3, lines 14-63.

The wording "formed from a ceramic paste...." at the last two lines of claim 24 is a product-by-process expression and denotes no particular structural property to the final product. For the purpose of this rejection, it is totally irrelevant how the final product is derived, so long as applicant's claimed final product does not structurally distinguish from the reference.

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This change in the reasoning of the rejection is prompted by applicant's amendment at the last two lines of claim 24 that cancelled the positive recitation of the pasty layer.

Applicant argues that Friese does not disclose a measuring gas chamber and a reference gas chamber in the same layer plane.

This argument is not persuasive. As stated before, that the measuring gas chamber of Friese is partly within the measuring gas chamber layer plane satisfies applicant's claim language.

Applicant also argues that Friese does not disclose the measuring gas chamber sheet to be formed by screen-printing. That is, while a sheet may have layers formed on them by screen-printing, the sheets themselves are not taught to be formed by screen-printing.

This argument is totally non-persuasive for two reasons. First, the contorted reasoning that the discussion at col. 4, lines 15-20 of Friese includes forming layers on a sheet by screen-printing but does not include forming the sheet by screen-printing does not make any sense. Second, in as much as applicant's claims no longer positively recite the pasty layer but only that the sheet containing the gas chambers is formed from a pasty layer, whether the sheet containing the gas chambers is formed by screen-printing or not is now moot.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al '604.

This claim differs by calling for the reference electrode to comprise two opposing portions.

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Friese discloses an inner pump electrode comprising two portions 8-8'. See col. 3, line 23. It would have been obvious to provide two portions for reference electrode 11 as well in order to increase the reference electrode's surface area without additional space.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al '604 in view of Kato et al '947.

This claim differs by calling for the measuring electrode to also serve as a pump electrode. As discussed before, that feature is rendered obvious by Kato.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al '604 in view of Makino et al.

This claim differs by calling for the reference electrode to be located on a side of the reference gas chamber nearest a large surface of the sensor element exposed to a sample gas. As discussed before, such a reference electrode location is rendered obvious by Makino.

Claims 38, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al '604 in view of Sasayama et al.

These claims differ by calling for the measuring electrode and the reference electrode to have a portion extending outside of its respective chamber. As discussed before, that is rendered obvious by Sasayama.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friese et al '604 in view of Yamada.

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This claim differs by calling for a heater to be located halfway between the top and the bottom surfaces of the sensor element. As discussed before, that is rendered obvious by Yamada.

For all the rejections under 35 USC 103 based upon Friese as a primary reference, applicant argues that the secondary references do not cure the deficiencies of the primary reference. These are not separate and distinct arguments. Thus, no further comment is needed.

Claims 43-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Logothetis et al 4,487,680.

As discussed in the previous Office action, Logothetis discloses forming a zirconia layer by screen-printing on another zirconia layer. See col. 5, lines 57-67. Applicant's claims are not seen to recite more than that. The new wording at claim 43, last two lines, calling for "the solid electrolyte layer being applied to include a measuring gas chamber and a reference gas chamber" does not positively recite the gas chambers, because "to include" is projecting some prospective feature in the future that may or may not materialize and does not call for the gas chambers to be actually in being.

In regard to claims 44 and 45, if the gas chamber are not being positively recited, features (boundary, supporting element) related to the gas chambers are also not positively recited. In regard to claim 46, note that Logothetis discloses both electrolyte layers to comprise yttria-stabilized zirconia (col. 5, lines 58 and 63). As for claim 47, note that the patent teaches heating the sensor element (see col. 5, lines 29-34), which would constitute a heat treatment. Also, a

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solid electrolyte sensor such as that of Logothetis is routinely exposed to high temperature environments (e.g. combustion engine exhaust), which would heat the sensor element.

This rejection is prompted by applicant's amendment to the last two lines of claim 43.

Claims 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 or Friese et al '604 in view of Logothetis et al.

All references have been previously discussed. It would have been obvious to form the Ep or Friese sensor elements by screen-printing the sheet containing the gas chambers onto a zirconia layer in view of Logothetis, since screen-printing is a well-known technique for forming films and there is no unexpected result.

Applicant argues that Logothetis does not disclose a sensor element with a measuring gas chamber and a reference gas chamber.

This argument is not persuasive. Logothetis is being relied upon to show that screen-printing is a common technique for forming a zirconia layer over another zirconia layer. The primary references show the gas chamber, and whether Logothetis discloses gas chambers is irrelevant.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ep '740 or Friese et al '604 in view of Logothetis et al and Holfelder et al 4,502,939 or Mase et al 4,797,194.

This claim further differs by calling for the reference chamber to have a support element.

Holfelder discloses a porous filler material 42 within a gas chamber that acts as a support element. See col. 5, lines 12-55. Mase discloses providing support means 30, 72 within a gas

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chamber. See col. 7, line 10 to col. 8, line 29. It would have been obvious for Ep or Friese to adopt support means within its reference gas chamber in view of Holfelder or Mase so as to prevent the narrowing of the chamber and thus maintain proper access to the reference gas source.

Claims 26, 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These two claims are still considered to be indefinite in that the expressions “geometry of the partition is adapted....” (claim 26) and “the boundary being adapted to a shape....” (claim 28) are vague. Adapted in what sense?

Claims 27, 29 and 30 are objected to as being dependent upon a rejected claim. These claims would be allowable in independent form.

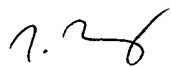
It is noted that claim 24, line 4, recites “at least one of into and out”. It would appear that “at least one of” should be deleted unless applicant contemplates pumping oxygen into and out simultaneously. It is also noted that claim 47 last two lines do not read correctly. It appears that “is converted” should be cancelled.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The examiner can be reached at 703-308-3329. His supervisor Nam Nguyen can be reached at 703-308-3322. Any general inquiry should be directed to the receptionist at 703-308-0661. A fax number for TC 1700 is 703-872-9306.



Ta Tung

Primary Examiner

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